

## STORMS AND WEATHER WARNINGS.

## WASHINGTON FORECAST DISTRICT.

So far as the occurrence of conditions calling for the issuance of special warnings is concerned, July, 1923, in the Washington Forecast District was uneventful. The only warnings of any character disseminated were those for small craft on the mornings of the 19th and 25th. On the first-named date a disturbance of minor energy was off Cape Hatteras apparently moving northeastward, and small-craft warnings were advised at and between Hatteras and Delaware Breakwater. Later, at 1 p. m., an advisory message concerning this disturbance was sent to stations on the middle Atlantic coast. As the disturbance moved northeastward it apparently lost energy.

On the morning of the 25th small-craft warnings were sent to stations on the New England coast in connection with a disturbance of moderate character that was then passing eastward over the New England states. No increase in energy took place as the disturbance moved out to sea.

In the West Indies and over the Caribbean Sea the month passed without any evidences of the presence of storms of tropical origin.—*C. A. Donnel.*

## CHICAGO FORECAST DISTRICT.

No warnings of any kind were issued for any portion of the Chicago Forecast District during July, 1923. Special forecasts were issued on July 3 and 4 in connection with the National Elimination Balloon Race held at Indianapolis, Ind., on the 4th.—*Chas. L. Mitchell.*

## DENVER FORECAST DISTRICT.

Areas of low pressure, mostly in the form of troughs, prevailed on the Rocky Mountain Plateau during the greater part of the month, attended by frequent thunderstorms, especially in Colorado and New Mexico. Numerous excessive local downpours occurred east of the divide in both of these States. A LOW of marked intensity that was over British Columbia on the 29th moved southeastward across the Missouri Valley on the 31st, attended by high temperatures in the northern portion of the district. This disturbance was followed immediately by an area of high pressure and lower temperature on the northeastern slope, thunderstorms and cooler weather extending to northern New Mexico.

No special warnings were issued during the month.—*J. M. Sherier.*

## NEW ORLEANS FORECAST DISTRICT.

Small-craft warnings were ordered displayed on the Texas coast, July 1, and the display was justified by the subsequent conditions. No other storm warnings were displayed and no storm occurred without warnings.

Special forecasts to alfalfa growers were sent to interests in Oklahoma whenever rains were forecast.—*I. M. Cline.*

## SAN FRANCISCO FORECAST DISTRICT.

Light rain fell in Washington and Oregon on the 6th and 7th, caused by a depression which formed over the lower Colorado River Valley on the 5th and moved rapidly northeastward over the plateau. The peculiar feature of this depression was that it caused neither showers nor thunderstorms in the plateau. Scattered

thunderstorms occurred in Nevada, Idaho, and the eastern portions of Washington and Oregon during the middle and latter part of the month, caused by depressions forming over the plateau.

There appears to be a close connection between the east and west oscillation of the North Pacific HIGH and the formation of depressions over the plateau and lower Colorado River Valley. During July, the HIGH would move slowly westward, impinging lightly on the coast; and then, without moving inland and often without the usual breaking off of a secondary, it would swing back into the Pacific and a depression would begin to develop over the plateau or lower valley of the Colorado. This condition occurred several times during June and July.

Fire-weather warnings were issued in California on the 3d and in Washington, Oregon, and Idaho on the 13th, and were fairly successful.

No storm warnings were issued.—*G. H. Willson.*

## RIVERS AND FLOODS.

By H. C. FRANKENFIELD, Meteorologist.

The precipitation over the eastern portion of the country was nearly normal during July, and as a result no rises of consequence were noted in the rivers of the Atlantic drainage, except in the Santee River system, where excessive rains on July 1 and 2 caused moderate rises. Warnings of flood stages in the Broad, Saluda, and Congaree Rivers were issued on July 2, but were not verified on account of unusually heavy pooling of water at dams in both the Broad and Saluda Rivers.

Owing to heavy rains on July 17-18 over southwestern Mississippi, the West Pearl River at Pearl River, La., reached a stage of 14.2 feet, 1.2 feet above flood stage. No warnings were issued, as it was thought that the swamps of the lower Pearl River would absorb most of the water before it reached Pearl River. Damage to the amount of \$10,000 was caused by this flood, \$5,000 to highways and bridges, and \$5,000 by suspension of business.

The Yazoo River flood ended on July 4, when the river at Yazoo City, Miss., fell below the flood stage of 25 feet. The river at this place had been continuously above the flood stage since March 2.

Heavy to excessive rains fell over the lower Missouri and the western half of the Grand River drainage basins on July 3-4. On the Missouri River the flood stage was slightly exceeded at Waverly, Mo., and on the Grand River at Chillicothe and Brunswick, Mo.

Warnings were issued for these floods and the resulting damage was very slight.

Moderate rains over the upper Neosho drainage basin during the first decade of the month caused a considerable rise in that river. A stage of 23.3 feet, or 1.3 feet above flood stage, was reached at Neosho Rapids, Kans. Flood warnings were not issued and practically no damage resulted, as the flood occurred very soon after the great floods of June, 1923.

The flood stage of 10 feet was exceeded in the Arkansas River at Pueblo, Colo., by 1.4 feet on July 12, due to heavy rains in the upper Arkansas drainage basin. Warnings were issued at the proper time and no serious damage was reported. Other local warnings for moderate rises in the upper drainage area were issued on July 18 and 25.

The Colorado River remained above flood stage at Parker, Ariz., throughout the month and at Lees Ferry, Ariz., until the 17th.